Sarem Journal of Medical Research. Volume 11, Issue 2, Summer 2026: 61- 65

The Report of a Becker Nevus Case

ARTICLE INFO

DOI: 1052547/sjrm.11.2.2

Article Type

Case Report

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Received: 31 May 2026
Accepted: 26 June 2026
e Published: 23 July 2026

Article History

ABSTRACT

Abstract: Becker nevus is a benign cutaneous hamartoma that usually presents as a unilateral hyperpigmented lesion with hypertrichosis. This lesion is most often diagnosed during puberty and most commonly affects the shoulder, arm, back, and chest. Although the exact cause is unknown, androgen receptor hypersensitivity and skin mosaicism are among the most important mechanisms proposed in the pathogenesis of this disease. Correct diagnosis of Becker nevus is of particular importance due to its clinical similarity to some congenital and acquired pigmented lesions. In this article, a 16-year-old girl is presented with a complaint of a large pigmented lesion on the outer surface of the right arm. The lesion gradually became more prominent around puberty and was accompanied by increased thickness and darkness of the hair in the area and the occurrence of intermittent acne. Clinical examination and history were without any musculoskeletal, skeletal, or other abnormalities. Based on the clinical features, the diagnosis of Becker's nevus was proposed and confirmed after reviewing the differential diagnoses. This article introduces and reviews Becker's nevus, a benign skin lesion, and reports a clinical case. While reviewing the clinical features, pathological findings, associated factors, and differential diagnoses, the article points out the importance of differentiating Becker's nevus from lesions such as congenital melanocytic nevus, cafe au lait spots, smooth muscle hamartoma, and other skin pigment disorders. Also, in cases where Becker's nevus is accompanied by muscular, skeletal, or breast abnormalities, the possibility of Becker's nevus syndrome is raised.
Becker's nevus is a benign lesion with a chronic course and a very low risk of malignancy, and its diagnosis is mainly based on the history and clinical examination. Physicians' awareness of the clinical features and differential diagnoses of this lesion can prevent unnecessary diagnostic procedures and lead to the selection of the most appropriate therapeutic approach and provide reassurance to the patient. This case report emphasizes the importance of paying attention to the clinical manifestations of Becker's nevus, especially in adolescents, and differentiating it from other pigmented skin lesions. Becker's nevus usually appears as a unilateral brown spot with irregular borders, which often darkens during puberty and is associated with thick hair growth (hypertrichosis). This lesion is most commonly seen on the shoulders, chest, back, and arms, and its exact cause is unknown, but increased sensitivity or number of androgen receptors in the skin plays an important role in its development. The risk of malignancy in this lesion is very rare.

Keywords: Mole; Nevus; Hyperpigmentation; Hypertrichosis; Becker Nevus; Case Report.

[DOI: DOI: 1052547/sjrm.11.2.2]

Introduction

Becker's nevus is a benign form of acquired skin hyperpigmentation that appears as a unilateral dark patch with excessive hair growth [1]. Becker's nevus has also been defined as a cutaneous hamartoma with localized hyperpigmentation and hypertrichosis [2]. Becker's nevus has also been described as “a benign abnormality clinically presenting as a flat or slightly raised, light to dark brown patch with irregular borders and moderate size” [3]. Becker's nevus is actually a cutaneous hamartoma composed of hair follicles and arrector pili muscles and is not a true neomelanocytic lesion (melanocytic nevus). Hence, the term Becker's nevus is actually a misnomer. Becker's nevus is usually diagnosed clinically, although in some cases, biopsy may be necessary to differentiate the lesion from congenital melanocytic nevus.

Becker's nevus usually presents as a unilateral hyperpigmented, hypertrichotic patch with onset in early adulthood, usually at or shortly after puberty. To help distinguish it from congenital melanocytic nevus and smooth muscle hamartoma, it is important to consider in the history whether the lesion was present from birth or developed later. During puberty, there is often a period of androgen-dependent lateral growth and darkening of the hair over the affected area (in a macular pattern) that lasts for several years before stabilizing. Although some patients report itching, these lesions are usually asymptomatic and are of cosmetic concern to the physician. Reported cutaneous findings in Becker's nevus include acneiform eruptions, eczematous dermatitis, tinea versicolor, ichthyosis, and lichen planus. Patients may complain of symptoms of any of these local disorders [4].

Becker's nevus, also called Becker's melanosis, is an organoid epidermal hamartoma characterized by hyperpigmentation and localized hypertrichosis, usually appearing unilaterally on the shoulder, chest, scapula, or arm. The condition may be congenital or acquired and often becomes more apparent during adolescence. Studies have reported overexpression of the androgen receptor in the affected skin, suggesting a role for androgen sensitivity. This may explain associated features such as hypertrichosis, acneiform changes, sebaceous hyperplasia, and histological findings such as acanthosis, rete ridge elongation, and androgen-responsive smooth muscle hyperplasia involving the arrector pili muscles. Various skin diseases such as acne, lichen planus, lichen striatus, eczema, psoriasis, ichthyosis, granuloma annulare, scleroderma, hypohidrosis, and pityriasis versicolor have been reported to be associated with Becker's nevus. Proposed mechanisms for this association include Wolff's isotopic response, androgen hypersensitivity, and underlying mosaicism within the nevus. Becker's nevus is now considered a hamartoma resulting from somatic mosaicism [5-8]. In other words, Becker's nevus is a benign lesion that can be congenital or acquired with alopecia or hypertrichosis. It is a rare condition that predominantly affects males. It is often pigmented and darkens over time, with excessive hair growth [9].

Clinical features, pathology, and associated factors

Clinical features

On physical examination, most lesions appear as localized, unilateral macules, patches, or very thin plaques. They are most often located on the shoulders, front of the chest, and scapular region, although numerous other sites have been reported for this lesion [4].The lesions range in color from light to dark brown and are usually uniformly pigmented. There is often an irregular, well-defined border that develops into small satellite islands of hyperpigmentation. The diameter of the lesions varies from a few centimeters to more than 20 centimeters [4]. Hypertrichosis is a characteristic finding and develops after pigmentation (sometimes up to 2 years later), and the hair becomes thicker and darker over time. In some cases, hypertrichosis may be mild or even absent [4]. The lesion typically presents as a unilateral brown patch with irregular borders [4].

During or after puberty, the spot may darken and be covered with thick, dark hair (hypertrichosis) [10]. Acne or acne-like lesions may sometimes be seen within the lesion [3]. This lesion is more common on the shoulders, back, and upper chest and less common on the limbs or in unusual areas of the skin [11]. In this lesion, there may be an increase in dermal smooth muscle bundles (such as smooth muscle hamartoma in some lesions) [3]. Occasionally, collagen hamartoma lesions have been reported under the mole [2]. Hyperkeratosis, acanthosis, and focal thickening and thickening of the rete ridges (RRs) are variable. The bases of the rete ridges are often flat and appear rectangular or square, which is less noticeable on examination and can aid in the diagnosis in the absence of other histological findings. An increase in the number of erector pili muscles may be seen, reflecting the smooth muscle hamartomatous component of the Becker's nevus. The amount of basal pigmentation, number of hair follicles, and smooth muscle vary considerably, and if the dermatologist is unaware of the clinical history, the biopsy may be interpreted as normal skin. In addition, there may be concomitant suppurative folliculitis with or without rupture and surrounding purulent granulomatous inflammation [4].

Pathology

The exact cause of Becker's nevus is unknown, but the role of androgen sensitivity or increased androgen receptor numbers in the skin of the lesion has been suggested, especially since the lesion appears at puberty and is more common in men [1]. Some sources

[DOI: DOI: 1052547/sjrm.11.2.2]

have suggested that Becker's nevus may represent skin mosaicism. In other words, a post-fertilization mutation has resulted in a different cell colony in the skin of that area [2]. In other studies, it has been reported that mutations in genes such as β-action may also be associated with Becker's nevus [1].

Associated factors

Becker's nevus is a benign lesion, and malignant transformation is remarkably rare [4]. When a Becker's nevus is accompanied by ipsilateral muscular, skeletal, or cutaneous abnormalities, it is called Becker's nevus syndrome [2]. In Becker's nevus syndrome, localized muscular, skeletal, or adipose abnormalities or breast tissue changes may be seen. Breast changes may be seen on the same side of the body as the nevus. In women, these changes usually present as breast hypoplasia or hypotrophy; however, in very rare cases, an increase in breast size on the same side has been reported, resulting from hyperplasia of the mammary glandular tissue or hypertrophy of adipose tissue or fibrosis [1,2].

Differential diagnoses

In Table 1, the cases that are differential cases in the accurate diagnosis of this type of mole are stated. The key point in the differential diagnosis of this lesion is that in Becker's nevus, melanocytes do not increase; rather, melanin accumulates more in keratinocyte cells. For this reason, the color of the lesion is dark, and there is no risk of malignancy.

Table 1. Differential diagnosis of Becker's nevus

Differential Diagnosis	Similar Features to Becker's Nevus	Distinguishing Features
Congenital Melanocytic Nevus (CMN)	Pigmented lesion, often with hypertrichosis; early onset in childhood.	Usually present at birth or in early childhood; darker and more elevated; contains numerous melanocytic nevus cells; changes are less influenced by puberty and androgen stimulation.
Congenital Smooth Muscle Hamartoma	Slightly hyperpigmented plaque with mild hypertrichosis.	Present at birth; usually has less pigmentation and less hair than Becker nevus; often demonstrates a **pseudo-Darier's sign**; Becker nevus shows more prominent epidermal changes.
Café-au-Lait Macule (CALM)	Flat pigmented macules, usually light to medium brown, which may become more apparent during puberty.	Typically has smooth borders, uniform pigmentation, and lacks coarse terminal hair; hypertrichosis, if present, is minimal. Becker nevus develops coarse hair at puberty and exhibits epidermal hyperplasia.
Nevus Spilus	Light-brown background patch with multiple small melanocytic macules or papules.	Becker nevus usually has more homogeneous pigmentation, whereas nevus spilus contains multiple darker speckles on a lighter background. Hypertrichosis and epidermal changes are more prominent in Becker nevus.
Pityriasis Versicolor	Hyperpigmented skin patches that may resemble Becker nevus in color.	Usually associated with pruritus and fine scaling; potassium hydroxide (KOH) examination is positive; responds to antifungal therapy. Becker nevus is stable and lacks characteristic scaling.
Post-Inflammatory Hyperpigmentation (PIH)	Pigmentation following skin inflammation that may resemble Becker nevus.	History of preceding inflammation or trauma; pigmentation may gradually fade over time; lacks coarse hair, epidermal hyperplasia, and smooth muscle proliferation; borders are usually less well-defined than in Becker nevus.
McCune–Albright Syndrome	Large café-au-lait–like hyperpigmented patches associated with systemic abnormalities.	Café-au-lait lesions typically have irregular **"coast of Maine"** borders and are associated with endocrinopathies and other systemic manifestations. Becker nevus is generally not associated with widespread endocrine abnormalities.
Plexiform Neurofibroma	May present as a large pigmented patch with localized skin thickening or raised areas.	Usually soft with involvement of peripheral nerve tissue; may present as compressible soft-tissue swelling due to plexiform neurofibroma. Histopathology demonstrates Schwann cells, fibroblasts, and intertwined nerve bundles. Becker nevus typically exhibits more prominent epidermal hyperplasia and increased melanin deposition.

[DOI: DOI: 1052547/sjrm.11.2.2]

Case presentation

A 16-year-old girl referred to the dermatology clinic at sarem superspecialty hospital with a complaint of a large pigmented patch on her arm. She did not mention any underlying disease in her history. On examination, a large, light brown macular lesion was seen on the right arm from near the shoulder joint to slightly below the elbow joint. In the area of this lesion, the hair on the limbs was slightly thicker and darker. No symptoms of inflammation, pain, burning, itching, or scaling were found in the history. The skin on other parts of the body was unremarkable. According to the patient, the lesion began around puberty, although she also reported a pale halo during childhood. The patient also mentioned the presence of intermittent pimples and acne on the lesion. Other examinations were unremarkable. None of the family members had such a problem.

Based on the patient's history and examination, two initial diagnoses were made: the first was congenital pigmented birthmark and the second was Becker's nevus. Given the presence of thick, dark hair on the lesion and the patient's complaint of acne, as well as the spread of the lesions since puberty, the diagnosis of Becker's nevus was confirmed. Since no deformity or other lesions were seen on physical examination, the possibility of Becker's syndrome was ruled out (Figure 1).

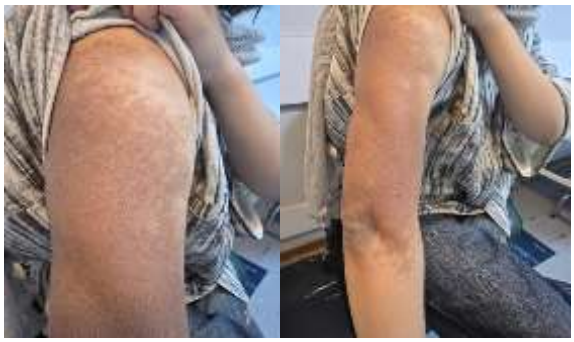

Figure 1. Clinical appearance of Becker's nevus on the patient's right arm

Given that there is no definitive treatment for Becker's nevus, the patient was advised to avoid direct exposure to sunlight to prevent the lesion from becoming more pronounced and to use laser hair removal to remove hair that had grown in the Becker's nevus. The patient was also prescribed a lightening cream containing hydroquinone, although the response to depigmenting agents in Becker's nevus is very limited and uncertain. A facial cleanser along with a topical anti-acne medication was also prescribed to treat intermittent acne.

Conclusion

Becker's nevus is a benign cutaneous hamartoma, although clinically often appears easy to diagnose, requires careful attention to the history, age of onset of the lesion, clinical course, and physical examination findings due to its similarity to some congenital and acquired pigmented lesions. The onset of the lesion around puberty, gradual increase in pigmentation, development of hypertrichosis, and sometimes association with acne are among the most important features that can help differentiate it from other skin lesions. In most cases, the diagnosis is made based on clinical findings, and only in suspicious cases is there a need for histopathological examination.

In the presented patient, the presence of a unilateral lesion with gradual darkening and thick hair growth during puberty, along with the absence of other skin, skeletal, or muscular abnormalities, supported the diagnosis of Becker's nevus and ruled out the possibility of Becker's nevus syndrome. Although there is no definitive treatment for this lesion, educating the patient about the benign nature of the disease, controlling aggravating factors such as prolonged exposure to sunlight, and using cosmetic treatments such as laser hair removal and adjuvant treatments to reduce darkening or control acne can improve quality of life and increase patient satisfaction. Given the relatively low prevalence of Becker's nevus, especially in women, reporting clinical cases can be effective in increasing physician awareness and improving diagnostic accuracy. Also, further studies on the pathogenesis, genetic factors, and response to various treatments can help to better understand this lesion and provide more effective treatment strategies in the future. Ultimately, proper recognition of the clinical characteristics of Becker's nevus and their timely diagnosis will prevent unnecessary diagnostic and therapeutic measures and provide greater reassurance to the patient.

Ethical Issue

In conducting this research, all ethical principles in medical and biological research were observed in accordance with the Declaration of Helsinki, and the rights, dignity, and confidentiality of the participants were protected.

Conflict of Interests

There was no conflict of interest in this study.

Source of Funding

The costs of this project were funded by the Sarem Gynecology, Obstetrics and Infertility Research Center.

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[DOI: DOI: 1052547/sjrm.11.2.2]